Claims

What is claimed is:

1. A semiconductor device comprising:

a first semiconductor package having a first semiconductor chip;

a second semiconductor package supported on the first semiconductor package so that an end of the second semiconductor package is arranged directly above the first semiconductor chip; and

a first projection supporting the end of the second semiconductor package directly above the first semiconductor chip.

2. The semiconductor device according to claim 1, further comprising:

a third semiconductor package supported on the first semiconductor package so that an end of the third semiconductor package is arranged directly above the first semiconductor chip; and

a second projection supporting the end of the third semiconductor package directly above the first semiconductor chip.

3. The semiconductor device according to claim 2, wherein the second semiconductor package is spaced apart from the third semiconductor package.

4. The semiconductor device according to claim 2, wherein the second semiconductor package and the third semiconductor package are different in at least one of size, thickness, and material.

5. The semiconductor device according to claim 2, wherein at least one of a space between the second semiconductor package and the third semiconductor package, a space between the first semiconductor package and the second semiconductor package, and a space between the first semiconductor package and the third semiconductor package is filled with resin.

6. The semiconductor device according to claim 1, wherein the first semiconductor package has a first carrier substrate, the first semiconductor chip being flip-chip mounted on or above the first carrier substrate; and

the second semiconductor package has second semiconductor chips mounted on or above a second carrier substrate, a bump that is bonded to the first carrier substrate and that holds the second carrier substrate on or above the first semiconductor chip, and a seal for sealing the second semiconductor chips.

7. The semiconductor device according to claim 6, wherein the first semiconductor package comprises a ball grid array package in which the first semiconductor chip is flip-chip mounted on or above the first carrier substrate; and the second semiconductor package comprises at least one of a ball grid array package and a chip-size package in which the second semiconductor chips mounted on or above the second carrier substrate are sealed by molding.

8. The semiconductor device according to claim 6, wherein the bump is arranged on the second carrier substrate away from the mounting region of the first semiconductor chip; and

the projection is arranged so that the second carrier substrate is supported at four corners.

9. The semiconductor device according to claim 6, wherein the first semiconductor chip comprises a logical operation element; and

the second semiconductor chips comprise memory elements.

10. The semiconductor device according to claim 6, wherein the second semiconductor chips have a three-dimensionally mounted structure.

11. An electronic device comprising:

a first package having an electronic component;

a second package supported on the first package so that an end of the second package is arranged directly above the electronic component; and

a projection supporting the end of the second package directly above the electronic component.

12. An electronic apparatus comprising:

a first semiconductor package having a semiconductor chip;

a second semiconductor package supported on the first semiconductor package so that an end of the second semiconductor package is arranged directly above the semiconductor chip;

a projection supporting the end of the second semiconductor package directly above the semiconductor chip; and

a motherboard having the second semiconductor package.

13. A method for manufacturing a semiconductor device comprising the steps of:

mounting a first semiconductor chip on or above a first carrier substrate;

mounting second semiconductor chips on or above a second carrier substrate;

forming a first bump on the underside of the second carrier substrate away from areas surrounding at least one vertex of the second carrier substrate;

forming a first projection on areas surrounding the other vertices displaced from the first bump; and

bonding the first bump to the first carrier substrate so that the first projection is arranged on the first semiconductor chip.

14. The method for manufacturing a semiconductor device according to claim 13, further comprising the steps of:

mounting third semiconductor chips on or above a third carrier substrate;

forming a second bump on the underside of the third carrier substrate away from areas surrounding at least one vertex of the third carrier substrate;

forming a second projection on areas surrounding the other vertices displaced from the second bump; and

bonding the second bump to the first carrier substrate so that the second projection is arranged on the first semiconductor chip.

15. A method for manufacturing an electronic device comprising the steps of:

mounting a first electronic component on or above a first carrier substrate;

mounting second electronic components on or above a second carrier substrate;

forming a first bump on the underside of the second carrier substrate away from areas surrounding at least one vertex of the second carrier substrate;

forming a first projection on areas surrounding the other vertices displaced from the first bump; and

bonding the first bump to the first carrier substrate so that the first projection is arranged on the first electronic component.